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for

J.C. Pennco Waste Oil Service

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July 1994

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STATE SUPERFUND PROGRAM

HAZARD RANKING SYSTEM ASSESSMENT

J.C. Pennco Waste Oil Service Site
San Antonio, Texas
Bexar County
Volume I of III

Texas Natural Resource Conservation Commission *July 1994*
Austin, Texas

J.C. PENNCO WASTE OIL SERVICE
HAZARDOUS RANKING PACKAGE

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J.C. PENNCO WASTE OIL SERVICE
HAZARDOUS RANKING PACKAGE
LOCATION OF SITE

Facility Name: J.C. Pennco Waste Oil Service

Location: 4927 Higdon Road, San Antonio, Bexar County, Texas.

TWC District Office: San Antonio, Region 13

TXD#: 982 864 162 **SWR#:** 52029

Site Legal Description: All that certain tract of land containing 5.0 acres, being surveyed out of a 17.7012 acre tract of land, described in a deed of trust from Bernard Leiser and Lloyd E. Grimes to Ned M. Wells Jr. on July 2nd, 1973 recorded in Volume 7118, Pages 225-229 Deed of Trust Records, Bexar County, Texas, being out of the West part of Tract #2, of the subdivision of the W. F. Gembler Estate Tract Partition #2, of the Pilas Chaves tract and being further a part of the V. E. Howard Tract being out of the Juan Montez Grant, situated on the North Right of Way line of Higdon Road 2,035.7' in a Southeasterly direction from the Northeast corner of W.W. White Road and Higdon Road, intersection and being more particularly described by metes and bounds as follows:

BEGINNING	At the Northeast corner of the present intersection of Higdon Rd. and W.W. White Rd. Right of Way;
THENCE	South 85 deg., 40 min. East 2,035.7' along the North Right of Way line of Higdon Rd. to an Iron set at a point that is North 85 deg., 40 min. West 154.3' from the Southeast corner of aforementioned 17.7012 acre tract for the Southwest corner of this tract being herein described, and the point of beginning for this survey;
THENCE	North 04 deg., 42 min., 46 sec. East 1,384.75' to an Iron pin set on the North line of said 17.1012 acre tract for the Northwest corner of this tract;
THENCE	North 75 deg., 17' East 163.63' to an Iron pin found at the Northeast corner of said 17.7012 acre tract for the Northeast corner of this tract;
THENCE	South 04 deg., 42 min., 46 sec. West 1,438.82' along the East boundary line of said 17.7012 acre tract to an Iron pin found on the North Right of Way line of Higdon Rd. at the Southeast corner of said 17.7012, for the Southeast corner of this herein described tract;

THENCE North 85 deg., 40 min. West 154.3' along the North Rightof Way line of Higdon Rd. to the place of beginning as surveyed on the ground.

Person(s) in charge of the facility:

The facility is currently controlled by the Bankruptcy Court "Trustee" Mr. Randolph N. Osherow, 7701 Broadway #204, San Antonio, TX 78209 at (210) 738-3001.

Former owner of the now-abandoned facility is Mr. John Courtney Pennington, Sr., P.O. Box 200988, San Antonio, TX, 78220-0988.

Name of Preparer:

Debra D. Hendricks **Date:** 08/04/94
Debra D. Hendricks, Site Coordinator
Superfund Site Discovery and
Assessment Team

Name of Reviewers:

Date: 8/4/94
Wesley Newberry, Leader
Superfund Site Discovery and
Assessment Team

Stennie A. Meadours **Date:** 8/16/94
Stennie Meadours, Manager
Emergency Response and
Assessment Section

(The State predecessor agencies, Texas Water Quality Board, Texas Department of Water Resources, and Texas Water Commission, are referred to throughout this report as the Texas Natural Resource Conservation Commission (TNRCC). The new agency, TNRCC became effective September 1, 1993 as mandated under State Senate Bill 2 of the 73rd Regular Legislative Session)

General Description of the facility:

The site is at Latitude 29°19'15" N and Longitude 98°23'30" W in the City of San Antonio, Bexar County, Texas (see topographic maps, Attachment 1.4).

The J.C. Pennco Waste Oil Service is an inactive, used drum recycling and waste oil recycling facility on five acres located approximately .25 miles east of the intersection of Higdon Road and S.W.W. White Road on the north side of Higdon Road, in San Antonio, Texas (see Street Map - San Antonio, Attachment 1.1). The site became inactive on April 23, 1992 (see J.C. Pennco Answer and Request for Evidentiary Hearing, Attachment D of Attachment 2.27).

The site contains approximately twenty-five (25) tanks ranging in capacity from 500 to 10,000 gallons. A site inspection on March 4, 1993 indicated that many of the tanks on site were overflowing, lacked effective containment systems, and had holes cut in their tops and sides which were uncovered (see Site Visit Memorandum dated March 4, 1993 and Photographs 1 - 5, Attachment 2.30).

Approximately 4000 drums are scattered throughout the site. A majority of the drums, although appearing to be empty, contain residuals of paints, solvents, insecticides, herbicides, acids, and oilfield products. Many of the drums are leaking or overflowing (see Site Visit Memorandum dated March 4, 1993 and Photographs 6 - 9, Attachment 2.30).

Extensive areas of soil contamination exist throughout the site, numerous areas of dead or stressed vegetation are evident, and trees in the proximity of the drum-washing area are dead (see Site Visit Memorandum dated March 4, 1993 and Photographs 1 - 9, Attachment 2.30). Contaminated soils have been pushed into waste piles against the property fenceline or have been covered with uncontaminated soils or crushed limestone base material. Soil samples collected from the tank storage areas measured 26% TPH, lead (462 mg/kg) and chromium (101 mg/kg) (SW04658 - see IOM dated September 11, 1991), and solvents and benzene compounds (see page 2, IOM dated September 11, 1991, Attachment 2.16).

Large piles of contaminated wood mulch "berms", that had previously been sprayed with oily wastewater, are present throughout the site (see IOM dated March 4, 1993 and Photograph 1, Attachment 2.30).

In February, 1985 the District 8 Office received a complaint from a nearby livestock owner of the death of two of his cattle from the ingestion of waste oil runoff from the Pennco site. The cause of the deaths was confirmed by veterinary autopsy (see IOM dated May 24, 1985, in IV of Attachment 2.9).

Public, industrial, domestic and other (monitoring, irrigation) wells were identified within a 4 mile radius of the site. Analyses of samples obtained from water wells located adjacent to the site indicated the presence of the chlorinated solvents methyl-t-butyl ether (15 ug/l - SW013932) and tetrachloroethylene (2.2 ug/l - SW04667) in the groundwater (see page 4 and Table 9, IOM dated September 11, 1991, Attachment 2.16).

The five acre site is located in a rural area and is adjoined by residences and croplands. Residential trailers, homes and small businesses are located adjacent to the site on the south, east and west sides of the property. Croplands used for grain and grass production for animal feeding are situated adjacent to the north and east property lines (see page 1, of Attachment B of Attachment 2.27).

The site is accessible to the public, domestic livestock, and wildlife as the barbed-wire fence surrounding the site has partially collapsed (see IOM dated March 4, 1993, Attachment 2.30).

Background/Operating History:

On May 10, 1984 Mr. John C. Pennington purchased five acres at 4927 Higdon Road and moved the J.C. Pennco Waste Oil Service to the property that same year (see IOM dated May 24, 1985 of IV of Attachment 2.9 and Deed Records, Attachment 6).

On February 25, 1985 District 8, TWDR, received a citizen complaint from Edwardo Mendoza alleging that J.C. Pennco was receiving hazardous wastes at the Higdon Road location. Also on this date District 8 received a complaint from Richard Turknett, who resided at 4965 Higdon Road, alleging that hazardous wastes were being stored and mixed with waste oil at the J.C. Pennco Company. According to Mr. Turknett, two (2) Hereford cattle died because of exposure to hazardous waste runoff from the site. The cattle belonged to Jesse Beavers who lived adjacent to the J.C. Pennco Company. An autopsy of the cattle was performed by veterinarian Lloyd Sells. According to the veterinarian, the cattle died from internal hemorrhaging caused by the ingestion of oil. The stomachs of the cattle contained visible amounts of oil and emitted a strong solvent odor (see page 9 of Interoffice Memorandum dated July 8, 1991 of Attachment 2.9 and IV of Attachment 2.9).

On February 25, 1985 District 8 conducted an investigation of the site and collected samples from three (3) different surface storage tanks to determine if hazardous wastes were present. Photographs

of the site were taken during the investigation showing that wastes generated during blending were burned on site, drummed or discharged to the ground (see Investigation Report, IV of Attachment 2.9). Analytical results from the samples are as follows: (see Chain of Custody tags dated February 25, 1994 and Analytical Results Attachment 2.1)

Volatile Organics Analysis of the J.C. Pennco Waste Oil Tank Samples. Collected on February 25, 1985. Expressed in mg/kg.

Parameter	SW05124	SW05125	SW05129
Benzene	210.0	280.0	180.0
Toluene	730.0	820.0	15000.0
Ethyl Benzene	400.0	200.0	190.0
Xylene	1430.0	1200.0	840.0
C2 Cyclohexane	310.0		340.0
C3 Cyclohexane	3200.0	3600.0	1900.0
C3 Benzene	1900.0	1800.0	700.0
Nonane	4900.0	6900.0	3700.0
Dichlorobenzene		1200.0	
2-Methyl Butane		680.0	

SW05124 - Tank A = 10,000 Gallon Yellow Railroad Storage Tank.
SW05125 - Tank B = 8 feet x 27 feet 10,000 Gallon Storage Tank (Vegas Oil Co.).
SW05129 - Tank C = 1,300 Gallon Green Tank.

GC/MS Analyses of the J.C. Pennco Waste Oil Samples. Collected on February 25, 1985. Expressed in mg/kg.

Parameter	SW05126	SW05128	SW05127
Phenol	230.0		
Napthalene	550.0	400.0	300.0
Fluorene	Trace		Trace
Phenanthrene	Trace	Trace	250.0
p-Xylene	1,100.0	1,000.0	660.0
0-Cresol	250.0		
p-Cresol	250.0		
2-Methyl Napthalene	750.0	660.0	480.0
1-Methyl Naphthalene	550.0	430.0	380.0
1,4- Dichlorobenzene		180.0	
1,2-Dichlorobenzene		1,800.0	Trace

SW05126 - Tank A = 10,000 Gallon Yellow Railroad Storage Tank.
SW05128 - Tank B = 8 feet x 27 feet 10,000 Gallon Storage Tank (Vegas Oil Co.).
SW05127 - Tank C = 1,300 Gallon Green Tank.

On May 24, 1985, in an Interoffice Memorandum to Bryan Dixon, Enforcement and Field Operations Division, TDWR, Vernon R. Francis, Supervisor, District 8, requested that Mr. Dixon review an investigation report pertaining to the site investigation on February 25, 1985 for appropriate enforcement action (see IOM dated May 24, 1985, IV of Attachment 2.9).

On July 15, 1985, a letter was sent to Mr. Pennington from Robert G. Fleming, Enforcement and Field Ops Division, TDWR, informing him that J.C. Pennco had been referred by the TDWR District 8 office for enforcement action concerning noncompliance with the Industrial Solid Waste Rules (see letter dated July 15, 1985, V of Attachment 2.9).

On July 15, 1985 in an Interoffice Memorandum to Mary Reagan, Assistant General Counsel, TDWR, Bryan W. Dixon, Enforcement and Field Operations Division, TDWR, requested that immediate enforcement action against J.C. Pennco be scheduled (see IOM dated July 15, 1985, Attachment 2.2).

On July 30, 1985 a site inspection was conducted and a sample was collected from a tank of waste oils stored on site. (see Conference Record of Site Inspection dated July 30, 1985, VI of Attachment 2.9, IOM dated November 18, 1985, X of Attachment 2.9 and IOM dated September 11, 1991, Attachment 2.16). Analytical results are as follows: (see Chain of Custody tag dated July 30, 1985, Attachment 2.3 and results, page 4, IOM dated September 11, 1991, Attachment 2.16).

GC/MS and Volatile Organics Analysis of the J.C. Pennco Tank Sample. Collected on July 30, 1985. Expressed in mg/kg.

Parameter	SW06746
Phenol	130.0
2,4-Dimethyl Phenol	180.0
Naphthalene	99.0
Trichloroethylene	61.0
Cresol	1800.0

On August 19, 1985 a letter was sent to Mr. Pennington from Bryan Dixon, Chief, Solid Waste and Spill Response Section, informing him of the institution of enforcement action as a result of noncompliance with the Texas Industrial Solid Waste Rules at the site. Responses from Mr. Pennington to this action were never received (see Letter dated August 19, 1985, VII of Attachment 2.9).

On September 13, 1985 a Notice of Violation letter was addressed to the Defense Property Disposal Office from Merton G. Coloton, Chief,

Hazardous and Solid Waste Division, advising that 25 drums of hazardous waste that originated from Kelly Air Force Base were being stored on site. The DPSO was advised that shipment of these wastes to this site was made without an accompanying manifest nor was the J.C. Pennco site authorized to receive or dispose of hazardous waste. The letter advised the DPSO that enforcement action had been initiated against J.C. Pennco and that the TWC also intended to include the Department of Defense: U.S. Air Force in the enforcement action (see Letter dated September 13, 1985, VIII of Attachment 2.9).

On October 2, 1985, the Defense Reutilization and Marketing Service acknowledged receipt of the Notice of Violation letter and requested additional information on the characteristics and chemical constituents of the property in question (see Letter dated October 2, 1985, IX of Attachment 2.9).

On October 23, 1985 a site inspection was conducted and samples were collected from the 25 drums that originated from Kelly Air Force Base. The samples indicated that the drums contained high concentrations of tetrachloroethylene (see Attachment 2.5, X and XI of Attachment 2.9 and Attachment 2.16). Analytical results are as follows: (see results Attachments 2.4 and X and XI of Attachment 2.9)

GC/MS-VOA Analysis of the J.C. Pennco Site-Kelly Air Force Base Drums. Collected on October 23, 1985. Expressed in mg/kg.

Parameter	SW06809 Drum 1	SW06808 Drum 2	SW06807 Drum 3
Tetrachloroethylene	41,000.0	390,000.0	350,000.0
Naphthalene	52.0	28.0	Trace
Pananthrene	32.0	N.D.	N.D.
Xylene	270.0	186.0	330.0

N.D. - Not Detected

During the sampling of the drums on October 23, 1985 a transport truck from Associated Oil Services arrived at the site to remove waste oil that was being stored in a 10,000 gallon railroad tank car. The driver of the truck asked Mr. Pennington, during the loading of the tank truck, if he could discharge the wastewater contained in the bottom of the railroad tank car to the ground. Prior to loading of the tank truck, samples were collected from the waste oil contained in the railroad tank car and from the wastewater layer contained in the bottom of the tank car. Mr. Pennington identified three (3) companies using the J.C. Pennco site for storage of waste oils. The companies identified were Vegas Oil Company, which stored waste oil in two (2) 10,000 gallon

railroad tank cars, Associated Oil Services, which utilized the 10,000 gallon railroad tank car, and J.C. Pennco, which utilized the remainder of the tanks. Samples were collected from the J.C. Pennco, Vegas Oil Company, and Associated Oil Services storage tanks (see IOM dated December 17, 1985, Attachment 2.5, X and XI of Attachment 2.9 and IOM dated September 11, 1985, Attachment 2.16). Analytical results are as follows: (see Chain of Custody tags and results, Attachment 2.4)

GC/MS-VOA Analysis of the J.C. Pennco site - Vegas Oil Company Tank. Collected on October 23, 1985. Expressed in mg/kg.

Parameter	SW06800
1,2-Dichlorobenzene	700.0
Naphthalene	440.0
Toluene	140.0
Ethyl Benzene	63.0
Xylene	500.0
2,2,4-Trimethyl Pentane	360.0
2,3,4-Trimethyl Pentane	180.0
PCB	N.D.

N.D. - Not Detected

GC/MS-VOA Analysis of the J.C. Pennco Site - Associated Oil Services Tank. Collected on October 23, 1985. Expressed in mg/l.

Parameter	SW06801 (Water Portion)	SW06802 (Oil Portion)
Naphthalene	Trace	200.0
Methylene Chloride	170.0	na
Tetrachloroethylene	Trace	na
2-Butoxy Ethanol	1,000.0	na
2-(2-Methoxyethoxy) Ethanol	1,100.0	na
2-(2-Ethoxyethoxy) Ethanol	5,100.0	na
Benzyl Alcohol	300.0	na
2-(2-Butoxyethoxy) Ethanol	7,000.0	na
1,1'-oxybis[2-Methoxy]-Ethane	4,100.0	na
2-[2-(2-Ethoxyethoxy) ethoxy]-Ethanol	4,800.0	na
2-[2-(2-Butoxyethoxy)ethoxy]-Ethanol	7,500.0	na
3,6,9,12-Tetraoxahexadecanol	2,700.0	na
3,6,9,12,15-Pentoxanonadecanol	820.0	na
Toluene	na	160.0
Ethyl Benzene	na	57.0
Xylene	na	400.0
PCB	N.D.	N.D.

na - not analyzed
N.D. - Not Detected

GC/MS-VOA Analysis of the J.C. Pennco Site - Pennington Tanks A Through D. Collected on October 23, 1985. Expressed in mg/kg.

Parameter	SW06806 Tank A *	SW06805 Tank B	SW06804 Tank C	SW06803 Tank D
PCB	N.D.	N.D.	N.D.	N.D.
Naphthalene	29.0	Trace	290.0	140.0
Methylene Chloride	280.0	130.0	N.D.	110.0
2-(2-Methoxy Ethoxy)-Ethanol	4700.0	N.D.	N.D.	N.D.
2-(2-Ethoxy Ethoxy)-Ethanol	24,000.0	N.D.	N.D.	N.D.
2-(2-Butoxy Ethoxy)- Ethanol	20,000.0	N.D.	N.D.	N.D.
1,1'- Oxybis (2- Methoxy)-Ethane	5300.0	N.D.	N.D.	N.D.
2-[2-(2-Ethoxy Ethoxy) ethoxy]-Ethanol	20,000.0	N.D	N.D.	N.D.
2-[2-(2-Butoxy Ethoxy) Ethoxy]-ethanol	32,000.0	N.D.	N.D.	N.D.
Tetraglyme	3,300.0	N.D.	N.D.	N.D.
3,6,9,12- Tetraoxahexadecan-1-ol	12,000.0	N.D.	N.D.	N.D.
3,6,9,12,15-Pentaoxanonadecan-1-ol	3,100.0	N.D.	N.D.	N.D.
Xylene	69.0	380.0	1,040.0	1,580.0
Toluene	N.D.	200.0	530.0	1,560.0
Ethyl Benzene	N.D.	57.0	140.0	300.0
Benzene	N.D.	N.D.	55.0	37.0
1,1,1-Trichloroethane	N.D.	N.D.	660.0	240.0
Tetrachloroethylene	N.D.	N.D.	Trace	32.0
1,2-Dichlorobenzene	N.D.	N.D.	Trace	180.0

* - Expressed in mg/l N.D. - Not Detected.

2 2 9 5 0 0 3 1

On November 18, 1985 in an Interoffice Memorandum, Henry Karnei, District 8 presented to Bill Brown, Hazardous and Solid Waste Enforcement, a summary of the site inspections occurring on July 30 and October 23, 1985 and sample results from the July 30, 1985 sampling (see IOM dated November 18,1985, X of Attachment 2.9).

On December 17, 1985 in an Interoffice Memorandum, Henry Karnei, District 8 presented to Bill Brown, Hazardous and Solid Waste Enforcement, a summary of the sampling analysis conducted on October 23, 1985. Mr. Karnei also recommended that the central office reevaluate the decision to downgrade the DRMO from a High Priority Violator to a Class I Violator (see IOM dated December 17, 1985, XI of Attachment 2.9).

Also on December 17, 1985 in an Interoffice Memorandum, Henry Karnei, District 8 informed Bill Brown, Hazardous and Solid Waste Enforcement, of the purchase of Hazardous Waste from the Defense

Reutilization and Marketing Office by Mr. Pennington (see IOM dated December 17, 1985, Attachment 2.5).

On February 12, 1986 a site inspection was conducted by Henry Karnei, District 8 and Sherry Pierce, Enforcement Section. Mr. Pennington informed the inspectors that he was no longer in the waste oil business due to new regulations and poor market value. Mr. Pennington still had an inventory of waste oil in thirteen (13) tanks as well as many empty drums stacked up around the site. It was recommended to Mr. Pennington, by District inspector Henry Karnei and Enforcement Coordinator Sherry Pierce, TNRCC, that he clean up and drum the sludges. He was additionally told that although there were several problems remaining with the site that his situation would be reevaluated as he was closing the waste oil business. (see IOM dated March 3, 1986, XII of Attachment 2.9).

On March 3, 1986 in an Interoffice Memorandum to the file, Sherry Pierce, TWC Enforcement, summarized the findings of the February 12, 1986 site inspection (see IOM dated March 3, 1986, XII of Attachment 2.9).

On July 17, 1986 a site inspection was conducted by District 8 and Jim Martin, Solid Waste Enforcement Unit. At that time it was discovered that Pennco was operating a firewood and composting (mulch) business in conjunction with the waste oil operation. Residual paint solids were being incinerated on-site and leaking/overturned drums of waste oils were observed throughout the site. Additionally, drums were being covered with firewood. Mr. Pennington was backfilling a pond area located on the site. The waste being used to backfill the pond appears to have originated from a brick and tile company . Photographs were taken and a sample was collected from the fill material of the pond (see IOM dated August 18, 1986, Attachment 2.7 and IOM dated August 18 1994, XIII of Attachment 2.9). Analytical results are as follows: (see Chain of Custody tag and results, Attachment 2.6)

EP Toxicity/Leachate Analysis of Backfill Material Used in Pond at J.C. Pennco Site. Collected on July 17, 1986. Expressed in mg/l.

Parameter	SW08393 EP Toxicity	SW08393 TDWR Leachate
Barium	600.0	89.0
Cadmium	N.D.	N.D.
Chromium	54.0	N.D.
Lead	N.D.	N.D.

N.D. - Not Detected

On July 30, 1986 a Notice of Violation letter was addressed to Pennco concerning violations noted during the October 23, 1985 and July 17, 1986 inspections . A response from J.C. Pennco was never received by the Agency (see Letter dated July 30, 1986, XIV of Attachment 2.9).

In an August 18, 1986 Interoffice Memorandum to Sam Pole, Enforcement Section, Henry Karnei, District 8 summarized the results of the July 17, 1986 site inspection (see IOM dated August 18, 1986, Attachment 2.7).

On February 13, 1987 District 8 received a copy of an interoffice memorandum from Jim Martin, E.I.T., Solid Waste, to the file indicating that the site "showed substantial overall improvement over previous inspections". At this time all enforcement action against J.C. Pennco was terminated by the Central Office for reasons unknown to District 8 (see IOM dated February 13, ~~1994~~ 1987, XV of Attachment 2.9).

On December 19, 1990 a tank removal was performed by Pennco at Commercial Meat Market. Approximately 14,000 gallons of contaminated wastewater from the tank removal was discharged onto wood mulch piles at the site (see IOM dated September 11, 1991, Attachment 2.16).

On May 7, 1991, District 8 received an anonymous complaint concerning the discharge of oily contaminated wastewaters to surface and ground waters located adjacent to the J.C. Pennco Waste Oil Service site (see page 1, IOM dated July 8, 1991, Attachment 2.9).

On May 10, 1991 a citizen complaint was received. District 8 conducted a complaint investigation of the Higdon Road Site; however, no one was at the site and the front gate to the site was locked. At that time the inspector did not enter the site but observed that dead trees were located to the east of the site (see page 1, IOM dated July 8, 1991, Attachment 2.9).

On May 13, 16, 21, and 24, 1991 District 8 tried by telephone to contact Courtney Pennington. Either no answer or a recorded message was received and responding messages were left requesting that Mr. Pennington contact the District office (see page 1, IOM dated July 8, 1991, Attachment 2.9).

On May 28, 1991 a citizen complaint was received. A return visit was conducted at the site but again no one was present (see IOM dated July 8, 1991, Attachment 2.9).

On June 3, 1991 the inspector tried again to contact Mr. Pennington by telephone but was unsuccessful (see IOM dated July 8, 1991, Attachment 2.9).

On June 5, 1991 a citizen complaint was received about the site. Mr. Pennington was again not present and as the threat of an imminent discharge of wastes to surface and groundwaters appeared to exist, an investigation was conducted by District 8. Photographs and samples were collected (see IOM dated July 8, 1991, Attachment 2.9 and IOM dated September 11, 1991, Attachment 2.16). Analytical Results are as follows: (see IOM dated September 11, 1991, Attachment 2.16)

Total Metals and TCLP Analysis of Paint Sludges Disposed at the J.C. Pennco Waste Oil Service, Higdon Road Site. Collected on June 5, 1991. Expressed in mg/kg or mg/l.

Parameter	A	B	C	D
Barium	620	1.89	43	0.470
Cadmium	0.65	<0.01	0.87	<0.01
Chromium	567	0.221	242	0.292
Lead	2810	0.670	1010	0.660

A = SW04660, Total Metals, mg/kg; Composite Sample collected from Paint Sludge Disposal Area.
B = SW04660, TCLP Metals, mg/l; Composite Sample collected from Paint Sludge Disposal Area.
C = SW04661, Total Metals, mg/kg; Composite Sample collected from Paint Sludge Disposal Area.
D = SW04661, TCLP Metals, mg/l; Composite Sample collected from Paint Sludge Disposal Area. Results in mg/kg unless noted.

TCLP Analysis of Paint Sludges Disposed at the J.C. Pennco Waste Oil Service, Higdon Road Site. Collected on June 5, 1991. Expressed in mg/kg.

Parameter	SW04663	SW04657	SW04656
1,2,4-Trimethyl Benzene		900	3
1,3,5-Trimethyl Benzene		240	
Acenaphthene		174	
Acetone	150		
Barium, Total	2810		
Barium, TCLP, mg/l	0.486		
Bicyclooctotriene		15300	
Bis-Phthalate		158	
Butoxy Ethanol		3430	
C13 to C26 Hydrocarbons		15980	
C2,C3,C4 Benzenes	53600	2150(C3)	
Cadmium, TCLP,mg/l	<0.01		NA
Cadmium, Total	<1.0		NA
Chromium, Total	26		37
Chromium,TCLP,mg/l	<0.02		NA
Diethyl Benzene	15000	470	
Dihydromethyl Indene		480	
Ethanol Butoxy Ethoxy Ethoxy			491
Ethyl Benzene	15000		7
Ethyl Methyl Benzene	46000	1300	
Ethyldimethyl Benzene		420	
Fluoranthene		260	
Fluorene		135	
Isopropyl Benzene	3100		
Lead, Total	50	28	109
Lead, TCLP, mg/l	<0.05	-	NA
Methyl Propyl Benzene		320	3
Methyl Isobutyl Ketone	210		
Methyl Naphthalene		320	3
Methyl Benzene	12000	410	

Naphthalene	2419	674	3
Phenanthrene		430	
Phenol		348	
Pyrene		228	
Styrene		9100	
Tetramethyl Benzene		550	
Toluene	920		
Total Petroleum Hydrocarbons			180000
Undecane		210	4
Unidentified	6640	7650	781
Xylene	95000		48

SW 04663 = Composite Sample of "Red Colored" Paint Sludge Collected from the Paint Sludge Disposal Area. Total Metals, TCLP Analysis and GC/MS - Volatile Organic Analysis.

SW 04657 = Sample collected from an Open Top Red-Colored Drum located within the Washing/Cutting Area. Total Metals and GC/MS - Volatile Organic Analysis.

SW 04656 = Composite Soil Sample collected from Contaminated Soil Areas near the Drum Washing/Cutting Operation. Total Metals, TCLP, Volatile Organics Analysis and Total Petroleum Hydrocarbons.

TCLP Analysis of Paint Sludges disposed at the J.C. Pennco Waste Oil Service, Higdon Road Site. Collected on June 5, 1991. Expressed in mg/kg.

Parameter	SW04658	SW04659
1,2,4-Trimethyl Benzene	20	N.D.
1,3,5-Trimethyl Benzene	7	0.4
Alkene	N.D.	6
Bis-Adipate	N.D.	4
Bis-Phthalate	N.D.	37
Chromium, Total	101	51
Decane	7	N.D.
Di-n-Buthyl Phthalate	2	
Diethyl Benzene	9	N.D.
Ethyl Methyl Benzene	27	1.2
Ethyl Benzene	4	N.D.
Ethyldimethyl Benzene	14	N.D.
Glycine Methyl Oxododecyl	N.D.	34
Hexadecanoic Acid	N.D.	91
Hexadecanol Acetate	N.D.	15
Hydrocarbons (C12 to C13)	4955	43
Lead, Total	462	62
Methyl Naphthalene	5	N.D.
Methyl Indan	5	N.D.
Methyl Propyl Benzene	12	N.D.
n-propyl Benzene	3	N.D.
Naphthalene	36	N.D.
Octanioc Acid Methyl Ester	N.D.	0.5
Phenanthrene	34	N.D.
Propenoic Acid Methoxy Phenyl Ethyl Hexyl Ester	N.D.	30
Toluene	9	N.D.
Total Petroleum HydroCarbons	260000	2300
Trimethyl Benzene	10	N.D.
Undecane	17	N.D.
Unidentified	N.D. 533	N.D. 55
Xylene	23	3

N.D.- Not Detected

SW04658 = Composite Soil Sample Collected from Contaminated Soil Areas Adjacent to Waste Oil Tanks 1 through 8. Total Metals, TPH and GC/MS - Volatile Organics Analysis.

SW04659 = Composite Soil Sample collected from Contaminated Soil Areas Adjacent to Waste Oil Tanks 1 through 8. Total Metals, TPH and GC/MS - Volatile Organics Analysis.

TCLP Analysis of Paint Sludges Disposed at the J.C. Pennco Waste Oil Service, Higdon Road Site. Collected on June 5, 1991. Expressed in mg/kg.

Parameter	SW04662
1,2,4-Trimethyl Benzene	89
1,3,5-Trimethyl Benzene	30
Decanedioic Acid Didecylester	595
Diethyl Benzene	65
Dihydrolmethyl Indene	160
Ethyl dimethyl Benzene	480
Ethyl Benzene	75
Ethyl Methyl Benzene	77
Heptadienyne	1360
Hydrocarbons (C14 to C16)	1657
Methyl Propyl Benzene	320
Methyl Benzene	1200
Nonane	142
Phenanthrene	40
Phenol	115
Pyrene	208
Tetramethyl Benzene	890
Toluene	71
Trimethyl Benzene	84
Unidentified	868 1942
Xylene	500

SW 04662 = Sample collected from an Open Top Drum Labelled "KLN Steel Products, Inc.". GC/MS - Volatile Organics Analysis.

On June 10, 1991 a site sampling inspection was conducted. Water well samples were collected. Analytical results are as follows: (see results IOM dated September 11, 1991, Attachment 2.16)

GC/MA - Volatile Organics Analysis of Water Wells Located Adjacent to the J.C. Pennco Waste Oil Service. Higdon Road Site Collected on June 10. Results in ug/l.

Parameter	SW 04667	SW 04668
Cis-1,2-Dichloroethylene	2	N.D.
1,1-Dichloroethane	2	N.D.
1,1,1-Trichloroethane	1.2	N.D.
Tetrachloroethylene	2.2	N.D.
Methyl-t-Butyl Ether	2	N.D.
Unidentified	N.D.	5
Unidentified (Possible Thiocyano Compound)	N.D.	N.D.

N.D. - Not Detected
SW 04667 = Covey Water Well (Windmill) located Approximately 700 to 1000 feet West of the J.C. Pennco Waste Oil Service, Higdon Road Site; Sample collected June 10, 1991.
SW 04668 = Grimes Water Well (Pressure tank with submersible pump) Approximately 1/4 mile south of the J.C. Pennco Waste Oil Service, Higdon Road Site; Sample collected June 10, 1991.

On June 20, 1991, District 8 was contacted by the wife of Mr. Courtney Pennington concerning the complaint investigation that was conducted on June 5, 1991 with the concern that no one was present during the investigation to represent the company (see Page 5, IOM dated July 8, 1991, Attachment 2.9).

On June 24, 1991, District 8 contacted Mrs. Pennington by telephone and indicated to her that numerous attempts had been made to contact J.C. Pennco by both telephone calls and site visits. A site meeting with Mr. Pennington was then scheduled for June 27, 1991 (see IOM dated July 8, 1991, Attachment 2.9).

On June 27, 1991, District 8 representatives and Mr. Pennington conducted a solid waste compliance inspection at the site. During this inspection it was determined that Pennco was storing approximately 70,800 gallons of waste oil, 18,000 gallons of diesel fuel, 1,500 gallons of used brake fluid, and 2,000 gallons of ethylene glycol in 17 different tanks. It was estimated that 7000 drums were stored throughout the facility. Since the June 5, 1991, investigation Mr. Pennington had removed or sold drums and had covered many areas of contamination that had been photographed (see

photographs, IOM dated February 13, 1987, XV of Attachment 2.9) during the complaint investigation. Areas of contamination were either pushed into a waste pile up against the property fence line or were covered with fresh limestone base material. Very little, if any, contaminated soils or wastes were removed and placed into drums for proper disposal. During this inspection non-registered above-ground storage tanks were discovered on site and a TWC site directive was issued to Mr. Pennington (see IOM dated July 11, 1991, Attachment 2.10). A tour of the site indicated that three different companies were storing empty or partially empty drums or tanks on-site. Alamo Drum Company, Dixie Chemical Company and J.C. Pennco were operating at the site (see B. of Attachment 2.27). A sample of the waste on the ground was collected for analysis (see Solid Waste Inspection Report dated July 8, 1991, Attachment 2.8, 2.9, and 2.16). Analytical Results are as follows: (see results IOM dated September 11, 1991, Attachment 2.16)

Analyses of Wastes Disposed of at the J.C. Pennco Waste Oil Service, Higdon Road Site. Collected on June 27, 1991. Expressed in mg/kg.

Parameter	SW04698	SW04697	SW04696
1,2,4-Trimethyl Benzene	6900		
1,3,5-Trimethyl Benzene	3300		2600
2-methyl propyl Cyclohexane	5100		
2-methyl decane	2500		
2,4-Dimethyl Phenol			130
Benzene Acetaldehyde			3000
Bis-Phthalate	9		
C2,C3,C4 Benzenes	19827		28135
Cadmium, TCLP,mg/L		0.03	
Cadmium, Total		58	
Chromium, Total		848	
Chromium, TCLP,mg/L		0.089	
Decadienal	330		
Di-n-Buthyl Phthalate	57		
Dimethyloctanes	7400		
Ethanol Buthoxy			1130
Ethyl Benzene	4200		28000
Hydrocarbons (C12 to C13)	180000 (18%)		
Isopropyl Benzene			4100
Lead, Total		337	
Lead, TCLP, mg/L		0.250	
Methyl Naphthalene	2294		10000
Methyl Isobutyl Ketone			450
Naphthalene			17900
Nonane	14000		
p-isopropyl Toluene	910		1000
Pentachlorophenol	27		
Phenanthrene	1800		
sec-butyl Benzene			570
t-decahydronaphthalene	3500		
Toluene	260		
Trimethyl Benzene			2600

Undecane	19000		
Unidentified	2294 12000		
Xylene	21000		150000

SW04698 = Sample Collected from Drum Residual Wastes Disposed at/in or near the Drum Washing/ Cutting Operation. GC/MS - Volatile Organics Analysis.
SW 04697 = Composite Soil Sample collected from Contaminated Soil Areas near the Drum Washing/Cutting Operation. Total Metals, TCLP, Volatile Organics Analysis and Total Petroleum Hydrocarbons.
SW04696 = Sample collected from an Open Top Drum Labelled "KLN Steel Products, Inc." located Within an Area of Storage of Empty Drums. GC/MS - Volatile Organics Analysis.

On July 8, 1991 an Interoffice Memorandum was sent to the files from Henry Karnei, District 8, detailing the results of the June 27, 1991 complaint investigation, summarizing alleged violations and requesting enforcement action against the following industrial solid waste generators who disposed of their industrial solid wastes at the J.C. Pennco Site:

J.C. Pennco SW No. 52029
Columbia Industries, Inc. SW No. 32616
KLN Steel Products, Inc. SW No. 31259
Alamo Drum Company SW No. 31347
Dermatological Products, Inc. SW No. 30538
Dixie Chemical Company SW No. None
USPCI-Hydrocarbon Recyclers SW No. 31905
Corpus Christi Naval Air Sta. SW No. ?
Southwest Research Institute SW No. 69046
Safety-Kleen Corporation SW No. 69048

(see IOM dated July 8, 1991, Attachment 2.9).

On July 11, 1991 an Interoffice memorandum was sent to the PST Division from District 8 regarding the discovery of unregistered above-ground storage tanks at the site during the inspection on June 27, 1991 (see IOM dated July 11, 1991, Attachment 2.10).

On July 12, 1991 a letter was sent to Mr. Pennington from James R. Bard, TWC, indicating that tanks at the facility had not been registered and instructing that the tanks be registered (see Letter dated July 12, 1991, Attachment 2.11).

On July 25, 1991 enforcement action was initiated (see Violation Summary Sheet, Attachment 2.12).

On July 29, 1991 in a phone call from Mr. Pennington to M.L. Patterson, TWC, information was requested on which of his tanks needed to be registered (see Telephone Memo to the file, Attachment 2.13).

On August 2, 1991 a site sampling inspection was conducted. A water well sample was collected (see results IOM dated September 11, 1991, Attachment 2.16).

GC/MA - Volatile Organics Analysis of Water Well Located Adjacent to the J.C. Pennco Waste Oil Service, Higdon Road Site. Collected on August 2, 1991. Results in ug/l.

Parameter	SW013932
Cis-1,2-Dichloroethylene	N.D.
1,1-Dichloroethane	N.D.
1,1,1-Trichloroethane	N.D.
Tetrachloroethylene	2
Methyl-t-Butyl Ether	15
Unidentified	N.D.
Unidentified (Possible Thiocyano Compound)	14

N.D. - Not Detected
SW 013932 = Covey Water Well (Windmill) located Approximately 700 to 1000 feet west of the J.C. Pennco Waste Oil Service, Higdon Road Site; Sample collected August 2, 1991.

On August 12, 1991 a letter was sent to Mr. Pennington from James R. Bard, TWC, indicating that tanks at the site had not been registered and instructing that the tanks be registered (see Letter, Attachment 2.14).

On August 16, 1991 a Facts Meeting was held in Austin between representatives of the TWC and Pennco. *An Executive Director's Preliminary Report to the Commission* was prepared recommending penalties in the amount of $88,800 for the violations described within the report (see Record of Facts Meeting, Attachment 2.15).

In an August 20, 1991 letter, Anne C. Dobbs, Hazardous and Solid Waste Division, TWC, sent Mr. Courtney Pennington a Notice of Solid Waste Violations and Requirements of Emergency Actions. Violations included:

1. 31 TAC, Section 335.4 - General Prohibitions and TWC 26.121 - Unauthorized Discharges Prohibited.
2. 31 TAC, 335.2 - Permit Required. J.C. Pennco Waste Oil Service has received, stored and disposed of industrial solid waste without a permit or other authorization from a Texas state agency.
3. 31 TAC, 335.6 - Notification. J.C. Pennco Waste Oil Services has not notified the TWC of the generation of bottom sludge and wastewater from the waste oil storage tanks and the rinsate or residuals removed from waste drums. In addition, the company has not notified the TWC of the disposal of industrial solid waste or municipal hazardous waste on-site or identified the use of drum and tank storage facilities as

waste management units.

4. 31 TAC, 335.12 - Shipping Requirements. J.C. Pennco Waste Oil Service regularly receives Class I waste without a manifest.
5. 31 TAC, 335.62 - Hazardous Waste Determination. A hazardous waste determination has not been conducted on solid wastes generated and discharged on-site.

Emergency actions requested by the TWC of the J.C. Pennco Waste Oil Service included:

1. Cessation of receipt of solid waste from off-site sources.
2. Implementation of security measures for the areas of contamination and areas where solid waste is stored.
3. Implement run-on/run-off control measures to ensure that contaminated stormwater is contained and properly disposed of.
4. Collect surface soil samples from areas which may have been impacted by run-off from contamination found in drainage ditches adjacent to the facility.
5. Remove and containerize visible areas of known off-site contamination adjacent to the site.
6. Submit an Off-site Facility Investigation Plan...to determine the extent of the contamination, both areal and vertical.
7. Implement the plan upon receipt of approval by the Executive Director.

(see A. of Attachment 2.27).

In a September 11, 1991 Solid Waste Inspection Report, Henry Karnei, Jr., District Inspector, TWC, presented results of inspections performed on June 5, June 27, June 10, and August 2, 1991 (see IOM dated September 11, 1991, Attachment 2.16).

On September 16, 1991 a facts meeting was held in Austin between representatives of the TWC and Pennco to discuss the above-listed violations. An *Executive Director's Preliminary Report to the Commission* was prepared recommending penalties in the amount of $88,800 for the violations described within the report (see List of Conference Attendees, Attachment 2.15 and Executive Director's Report, B of Attachment 2.27).

On January 7, 1992 a Notice of Violation was sent to Alamo Drum Company concerning the noncompliance noted during the June 27, 1991 inspection, citing the following violations:

1. 31 TAC §335.4/Texas Water Code §26.121 - Unauthorized Discharges Prohibited
2. 31 TAC §335.6 - Notification Requirements
3. 31 TAC §335.2 - Permit Required

In response to these alleged violations the TWC instituted enforcement action against Alamo Drum Company (see Letter dated January 7, 1992, Attachment 2.17).

In a February 24, 1992 letter, Don Lindsey, Alamo Drum Company, responded to Richard Clark, Industrial and Hazardous Waste Division, TWC, stated that his company was in the process of removing the drums that it had formerly stored on the Higdon Road site (see Letter dated February 24, 1992, Attachment 2.18).

On April 7, 1992 a letter entitled *Violations of Texas Solid Waste Disposal Act, the Texas Water Code and Rules of the Texas Water Commission* was mailed to J.C. Pennco Waste Oil Service and Alamo Drum Company. Included in the letter was a copy of the "*Notice of Executive Director's Preliminary Report and Petition for a Texas Water Commission Order Assessing Administrative Penalties and Requiring Certain Actions of J. C. Pennco Waste Oil Service and Alamo Drum Company*", and a copy of the *Executive Director's Preliminary Report*. Included in it is:

Part I - Waste Management Activities
Part II - Summary of Noncompliance and Penalties
Part III- Technical Recommendations

The date for Commission consideration of the Notice was scheduled for May 20, 1992 (see Letter dated April 7, 1992, C. of Attachment 2.27).

In an April 23, 1992 letter, Harry Skeins, Jr., Attorney, Skeins and Williamson, law firm representing J.C. Pennco, sent Mary Ruth Holder, Legal Division, TWC, an *Answer and Request for Evidentiary Hearing* and stated that Pennco did not consent to the penalty. The response also stated that Pennington had ceased operation of his business and had required his tenants to cease their operations as of April 23, 1992 (see Letter dated April 23, 1992, D. of Attachment 2.27).

On May 8, 1992 representatives of the Alamo Drum Company met with TWC Staff (see Letter dated May 29, 1992, Attachment 2.20).

On May 15, 1992 an Enforcement Conference was conducted to address the Settlement of Petition, Notice and Draft Order (see List of Enforcement Conference attendees, Attachment 2.19).

On May 20, 1992 Pennco filed an *Order Combined with Notice of Commencement of Case under Chapter 7 of the Bankruptcy Code, Meeting of Creditors, and Fixing of Dates* in Bankruptcy Court of the Western District of Texas (see Order dated May 20, 1992, E. of Attachment 2.27).

On May 21, 1992 the TWC received notice that on May 20, 1992 Pennco filed for bankruptcy (see Order dated May 20, 1992, E. of Attachment 2.27, and Bankruptcy Documents included in F. of Attachment 2.27).

On May 29, 1992 in a letter to the District 8 manager, Don B. Lindsey, Alamo Drum Company, reported that all of their drums had been removed from the site (see Letter dated May 29, 1992,

Attachment 2.20).

On June 25, 1992 the first meeting of creditors took place without TWC representation. Pennco's attorney announced the abandonment of the subject site on the grounds that it had a value of less than $2,500.00. This abandonment was entered as motioned and subsequently, the proceedings of the meeting were signed by the presiding officer of the court and filed in the Bankruptcy Court (see Documents, G. of Attachment 2.27).

On July 1, 1992 the United States Bankruptcy Court issued a NOTICE OF FIXING LAST DATE FOR FILING PROOFS OF CLAIM AND NOTICE OF DISCOVERY OF ASSETS to creditors of Mr. Pennington (see Notice dated July 1, 1992, Attachment 2.21).

On July 6, 1992, Randolph N. Osherow, Chapter 7 Trustee, requested from the United States Bankruptcy Court a TRUSTEE'S APPLICATION FOR AUTHORITY TO EMPLOY COUNSEL against Mr. Pennington (see Trustee's Application dated July 6, 1992, Attachment 2.22).

On July 10, 1992 the United Stated Bankruptcy Court issued an ORDER AUTHORIZING EMPLOYMENT OF COUNSEL FOR TRUSTEE for Mr. Osherow, Chapter 7 Trustee (see Order dated July 10, 1992, Attachment 2.23).

In a July 24, 1992 letter entitled *Request for Representation of the Texas Water Commission in Bankruptcy Proceedings*, Jesus Garza, TWC, requested representation from the Attorney General's office in the J.C. Pennco case (see Documents, G. of Attachment 2.27).

On August 19, 1992, in a letter to Henry Karnei, District 8, Thomas Edwards, AG's office, requested high, middle and low estimates of the cost of cleaning up the site (see Letter dated August 19, 1992, Attachment 2.24).

On September 8, 1992, in a letter to Randy Osherow, Bankruptcy Trustee, Thomas Edwards, AG's Office, requested custody of Mr. Pennington's records, including financial documents and invoices, pertaining to his operations at the site as evidence of liability (see Letter dated September 8, 1992, Attachment 2.25).

On September 25, 1992 in a letter to Mr. Johnson, Alamo Drum Company, H. Glenn Hall, Legal Division, TWC, issued a date for a settlement conference with Alamo Drum Company (see Letter dated September 25, 1992, Attachment 2.26).

On October 8, 1992 representatives from the AG's office conducted a records review at the Bankruptcy court and found that the site is now controlled by the "Trustee", Randy Osherow. A site visit was conducted (see IOM dated October 15, 1992, Attachment 2.27).

On October 14, 1992, DeAnna Epperson, Enforcement, provided Thomas Edwards, AG's office, in an Affidavit, low, middle, and high

estimates of the potential costs of remediating the site (see Affidavit dated October 14, 1992, I. of Attachment 2.27).

In an October 15, 1992 Interoffice Memorandum, DeAnna Epperson, Enforcement Coordinator, TWC, sent to Ben Wesley, Field Support, Field Ops Division, TWC a Referral to Screening Committee: *Request for Referral to Pollution Cleanup Division, J.C. Pennco Waste Oil Service, Bankruptcy Case* (see IOM dated October 15, 1992, Attachment 2.27).

On October 21, 1992 in a letter to Ann Dobbs, Industrial & Hazardous Waste Section, Thomas H. Edwards, Assistant Attorney General, recommended that the J.C. Pennco Waste Oil Service case be transferred to State Superfund (see Letter dated October 21, 1992, J. of Attachment 2.27).

In a December 1, 1992 Interoffice Memorandum, Anne Dobbs, Manager, Enforcement Section, TWC sent a *Referral to Pollution Cleanup Division* for the J.C. Pennco site based on the fact that RCRA had been exhausted against Pennco for the following reasons:
1. According to the bankruptcy court proceeding, Mr. Pennington has successfully abandoned the site. Therefore, J.C. Pennco would not be required to submit permit Parts A and B initiating the permitting process; submit an RFA and RFI; submit closure plans; show financial assurance; remediate the site; or conduct compliance monitoring; and
2. Any money recovered during District Court proceedings would be deposited into Superfund's Fund 550 for cleanup actions by the State (see IOM dated December 1, 1992, Attachment 2.28).

On January 26, 1993 in a letter to DeAnna Epperson, Enforcement, Thomas Edwards, AG's office, provided a copy of the Trustee's Complaint to Deny Chapter 7 Discharge. He also requested a cost estimate of removal/remediation at the site (see Letter dated January 26, 1993, Attachment 2.29).

On March 1 and 4, 1993 site visits were conducted by SSDAT and District 8. Photographs were taken (see Site Visit Memorandum dated March 4, 1993, Attachment 2.30).

On March 21, 1994 an Immediate Removal Action was initiated at the site. A fence was constructed around the site to provide site security, leaking drums were stabilized by overpacking or covering with plastic, covers over holes in tanks were constructed and warning signs were provided. (see Attachment 3.0).

On May 31, June 1 and June 2, 1994 a Site Sampling Inspection was performed at the site. Soil samples were taken on site and soil, sediment and groundwater samples were taken off-site. (see Site Sampling Inspection Memorandum and Analytical Results, Attachment 2.31).

Scores: (S_{gw}= 73.47, S_{sw}= 7.38, S_a= 0.00)

J.C. Pennco Waste Oil Service

Ground Water Route Work Sheet

Rating factor	Assigned Value (circle one)	Multi-plier	Score	Calc Value	Max. Score	Ref. (section)
1 Observed Release	0 (45)	1	45	45	45	3.1
If observed release is given a score of 45, proceed to line 4. If observed release is given a score of 0, proceed to line 2.						
2 Route Characteristics						
Depth to Aquifer of Concern	0 1 2 3	2	0	0	6	3.2
Net precipitation	0 1 2 3	1	0	0	3	
Permeability of the Unsaturated Zone	0 1 2 3	1	0	0	3	
Physical State	0 1 2 3	1	0	0	3	
Total Route Characteristics Score				0	15	
3 Containment	0 1 2 3	1	0	0	3	3.3
4 Waste Characteristics						3.4
Toxicity/Persistence	0 3 6 9 12 15 (18)	1	18	18	18	
Hazardous Waste Quantity	0 1 2 3 4 5 (6) 7 8	1	6	6	8	
Total Route Characteristics Score				24	26	
5 Targets						3.5
Ground Water Use	0 1 2 (3)	3	3	9	9	
Distance to Nearest Well/Population Served	0 4 6 8 10 12 16 18 20 24 24 (30) 32 35 40	1	30	30	40	
Total Targets Score				39	49	
6 If line 1 is 45, multiply 1 X 4 X 5 If line 1 is 0, multiply 2 X 3 X 4 X 5				42120	57,330	
7 Divide line 6 by 57,330 and multiply by 100 = S =				73.47		

22953003

J.C. PENNCO WASTE OIL SERVICE

Surface Water Route Work Sheet

Rating Factor	Assigned Value (circle one)	Multi-plier	Score	Calc Value	Max. Score	Ref. (section)
1 Observed Release	(0) 45	1	0	0	45	4.1
If observed release is given a score of 45, proceed to line 4. If observed release is given a score of 0, proceed to line 2.						
2 Route Characteristics						
Facility Slope and Intervening Terrain	(0) 1 2 3	1	0	0	3	4.2
1yr. 24 hr. rainfall	0 1 (2) 3	1	2	2	3	
Distance to nearest Surface Water	0 1 2 (3)	2	3	6	6	
Physical State	0 1 2 (3)	1	3	3	3	
Total Route Characteristics Score	....			11	15	
3 Containment	0 1 2 (3)	1	3	3	3	4.3
4 Waste Characteristics						4.4
Toxicity/Persistence	0 3 6 9 12 15 (18)	1	18	18	18	
Hazardous Waste Quantity	0 1 2 3 4 5 (6) 7 8	1	6	6	8	
Total Route Characteristics Score	....			24	26	
5 Targets						4.5
Surface Water Use	0 1 (2) 3	3	2	6	9	
Distance to a Sensitive Environment	(0) 1 2 3	2	0	0	6	
Population Served/ Distance to Water Intake Downstream	(0) 4 6 8 10 12 16 18 20 24 30 32 35 40	1	0	0	40	
Total Targets Score	....			6	55	
6 If line 1 is 45, multiply 1 X 4 X 5 If line 1 is 0, multiply 2 X 3 X 4 X 5	....			4752	64350	
7 Divide line 6 by 64350 and multiply by 100 S =				7.384615		

J.C. PENNCO WASTE OIL SERVICE

Air Route Work Sheet

Rating Factor	Assigned Value (circle one)	Multi-plier	Score	Calc Value	Max. Score	Ref. (section)
1 Observed Release	(0) 45	1	0	0	45	5.1
Date and Location:						
Sampling Protocol:						
If line 1 is 0, the S = 0. Enter on line 5.						
If line 1 is 45, then proceed to line 2.						
2 Waste Characteristic						5.2
Reactivity and Incompatibility	(0) 1 2 3	1	0	0	3	
Toxicity	(0) 1 2 3	3	0	0	9	
Hazardous Waste Quantity	(0) 1 2 3 4 5 6 7 8	1	0	0	8	
Total Waste Characteristics Score				0	20	
3 Targets						5.3
Population within 4 mile radius	(0) 9 12 15 18 21 24 27 30	1	0	0	30	
Distance to Sensitive Environment	(0) 1 2 3	2	0	0	6	
Land use	(0) 1 2 3	1	0	0	3	
Total Targets Score				0	39	
4 Mulitply 1 X 2 X 3				0	35,100	
5 Divide line 4 by 64350 and multiply by 100 S =				0		

2296-3001

J.C. PENNCO WASTE OIL SERVICE		
MIGRATION HAZARD MODE COMPUTATION		
	S	S^2
GROUNDWATER ROUTE SCORE	73.47	5397.84
SURFACE WATER ROUTE SCORE	7.38	54.46
AIR ROUTE SCORE	0.00	0.00
$S_{gw}^2+S_{sw}^2+S_a^2$		5452.31
$\sqrt{S_{gw}^2+S_{sw}^2+S_a^2}$		73.84
$\sqrt{S_{gw}^2+S_{sw}^2+S_a^2}/1.73$		42.68

GROUND WATER ROUTE

1. OBSERVED RELEASE Assigned score = 45

Ground water contamination of the uppermost water-bearing formation, the Leona Formation, is known to exist within one-quarter of a mile of the site. The site is underlain by Pleistocene fluviatile terrace deposits and the Leona Formation within the upper 45 feet of substrata. This formation is composed of fine calcareous silt grading down into coarse gravel and overlies several minor aquifers in the area, the Glenrose Limestone, Austin Chalk, and Carrizo-Wilcox Sand. Though not considered principal water-bearing units the formations cited above produce a limited source of ground water to shallow wells in the area. (References 1, 5, 9, and 11).

There is one (1) hand-dug well, owned by Mr. Floyd Covey, located approximately 700 feet west of the site. The well is used for irrigation and non-drinking household purposes and is completed at a depth of 33 feet BGS in the Leona Gravels. There are no driller's logs available for this well. The following contaminants were detected in the above well: (5 maximum):

Methyl-t-Butyl Ether	15.0 ug/l
Tetrachloroethylene	2.2 ug/l
Cis-1,2-Dichloroethylene	2.0 ug/l
1,1-Dichloroethane	2.0 ug/l
1,1,1-Trichloroethane	1.2 ug/l

(see Attachments 2.9 and 2.16)

There are three domestic wells, Grimes Well #1, Grimes Well #2, and Grimes Well #3, located .20 miles southeast of the site. The wells are used for drinking water and are completed in the Carrizo Sand or Wilcox Group. The wells were drilled in the early 1950's to depths of 100 -150 feet. There are no driller's logs available for these wells (see Attachments 4 and 7). The following contaminant has been detected in the Grimes Well #3:

1,1 Dichloroethene	199.0 ug/l

(see Attachments 2.31, 4, and Ref. 11)

Rationale for attributing the contaminants to the facility:

Previous enforcement actions and sampling at the Higdon Road site during July 30, 1985 and August 23, 1985, indicated that J.C. Pennco transported, blended and stored F-listed Solvents, primarily F001 and F002, from Kelly Air Force Base. Samples collected on July 30, 1985, measured 61 mg/kg of

trichloroethylene. Degradation reaction products of trichloroethylene include cis 1, 2 dichloroethylene, found in the Covey irrigation well (2.0 ug/l), and 1,1 dichloroethylene, found in the Grimes drinking water well (.199 ug/l) (see References 11 and 12, and Attachments 2.31 and 4). Samples taken from three drums labelled "Hazardous Waste from Kelly Air Force Base" on August 23, 1985, detected 4.1%, 35% and 39% tetrachloroethylene, respectively. Based on previous inspections and enforcement actions, J.C. Pennco Waste Oil Service has had a history of repeated discharges on-site to the ground at the Higdon Road site (see Attachments 2.9 and 2.16).

2. **ROUTE CHARACTERISTICS**

Depth to Aquifer of Concern Assigned Score = N.A.

Name/description of aquifer(s) of concern:

Depth(s) from the ground surface to the highest seasonal level of the saturated zone [water table(s)] of the aquifer of concern:

Depth from the ground surface to the lowest point of waste disposal/storage.

Net Precipitation Assigned Score = N.A.

Mean annual or seasonal precipitation (list months for seasonal):

Mean annual lake or seasonal evaporation (list months for seasonal):

Net precipitation (subtract the above figures):

Permeability of Unsaturated Zone Assigned Score = N.A.

Soil type in unsaturated zone:

Permeability associated with soil type:

Physical state Assigned Score = N.A.

Physical state of substances at time of disposal (or at present time for generated gases):

3. **CONTAINMENT** Assigned Score = N.A.

Method(s) of waste or leachate containment evaluated:

Method with highest score:

4. **WASTE CHARACTERISTICS** Total Route Characteristics Score = 24

Toxicity and persistence Assigned score = 18

Compounds evaluated:	**Toxicity**	**Persistence**
Chromium	3	3
Lead	3	3

(See Attachment 2.16)
(Reference 6)

Compound with highest score:

Chromium and lead

Hazardous Waste Quantity Assigned Score = 6

Total quantity of hazardous substances at the facility, excluding those with a containment score of 0 (Give a reasonable estimate even if quantity is above maximum).

91,000 gallons of liquids

Basis of estimating and/or computing waste quantity:

Estimates for liquids remaining in tanks and drums on site are based on number of tanks and drums remaining on site, volumes of liquids in tanks and drums, and tank capacities (see attachment 2.9).

91,000 gallons of liquids = 1820 drums = assigned value 5.

5. **TARGETS** Total Targets score = 39

Ground Water Use Assigned Score = 3

Use(s) of aquifer(s) of concern within a 3 mile radius of the facility:

Domestic, Public Supply, Industrial, Irrigation and Test Wells

(References 1,5, and 7)
(Attachment 3)

Distance to Nearest Well

Location of nearest well drawing from aquifer of concern or occupied building not served by a public water supply:

There are three domestic wells, Grimes Well #1, Grimes Well #2, and Grimes Well #3, located .20 miles southeast of the

site. The wells are used for drinking water and are completed in the Carrizo Sand or Wilcox Group. The wells were drilled in the early 1950's to depths of 100 -150 feet. There are no driller's logs available for these wells (see Attachments 4 and 7).

Distance to above well or building:

The wells are approximately 0.20 miles southeast of the hazardous substances on site.

(Attachment 4 and 7)

Population Served by Ground Water Wells Within a 3 mile Radius

Identified water supply well(s) drawing from aquifer(s) of concern within a 3 mile radius and populations served by each:

Domestic wells: 0 Located and 108 Plotted for a total of 108 wells = approximately 282 persons served.

Irrigation wells: 3 Located and one (1) Plotted in use within 3 miles of site.

Public Supply wells: One (1) within 3 miles of the site.

Industrial Wells: 8 within 3 miles of the site.

Bexar County 1992-1993 Texas Almanac Census Data

total population:	1,185,394
total houses in County:	453,948
San Antonio Population:	935,933

(Reference 8)

Persons per household (County): 2.61

1,185,394/453,948 = 2.611

Domestic Well Population:

Persons/household	2.61
domestic wells	x 108
target population	282

(Attachment 3)

Irrigation Well Population: 500 acres x 1.5 people = 750

Public Supply Well Population:

One well = 150 Connections x 2.61 persons = 392

(Attachment 4)

Computation of land area irrigated by supply well(s) drawing from <u>aquifer(s) of concern</u> within a 3 mile radius, and conversion to population (1.5 people per acre):

There are 500 acres of commercial groundwater irrigation (agricultural) within a 3 mile radius of the site.

500 acres x 1.5 people per acre = 750

(Attachment 4)

Total population served by ground water within 3 mile radius:

Domestic Well Population		282
Irrigation Well Population		750
Public Supply Well Population		<u>392</u>
TOTAL	1424	

Assigned Matrix Value - 30

SURFACE WATER ROUTE

1. **OBSERVED RELEASE** N/A

Contaminants detected in surface water at the facility or downhill from it (5 maximum):

There is no documented evidence of release of any of the substances of concern to the surface water in the area.

Rationale for attributing the contaminants to the facility:

N/A

2. **ROUTE CHARACTERISTICS** Total Route Charteristics Score = 11

Facility Slope and Intervening Terrain Assigned score = 0

Average slope of facility in percent:

.33% (Rise - 5 feet / Run - 1500 feet x 100)

(Reference 4)

Name/description of nearest downslope surface water:

The nearest downslope surface water is a tributary of Rosillo Creek, which runs into Salado Creek in Stream Segment No. 1910.

(Attachment 1.4)
(Reference 4)

Average slope of terrain between facility and above-cited surface water body in percent:

2.4% (Rise - 65 feet / Run - 2640 feet x 100)

(Attachment 1.3)
(Reference 4)

Is the facility located either totally or partially in surface water?

No

(Attachment 1.3)
(Reference 4)

Is the facility completely surrounded by areas of higher elevation?

No

(Attachment 1.3)
(Reference 4)

1 Year 24 hour Rainfall in Inches Assigned score = 3

3.5 inches

(Reference 2 and 7)

Distance to Nearest Downslope Surface Water Assign. Score = 2

2640 feet

(Attachment 1.3)
(Reference 7)

Physical State of Waste Assigned score = 3

Liquids and sludges

3. **CONTAINMENT** Assigned score = 3

Method(s) of waste or leachate containment evaluated:

Containers - leaking drums and no diversion structures: 3 points

Method with highest score:

Leaking drums with no diversion structures

4. **WASTE CHARACTERISTICS** Total Route Characteristics Score = 23

Toxicity and Persistence

Compound(s) evaluated:	**Toxicity**	**Persistence**
chromium	3	3
lead	3	3

Compound with highest score:

Chromium and lead

Hazardous Waste Quantity Assigned Score = 5

Total quantity of hazardous substances at the facility, excluding those with a containment score of 0 (Give a reasonable estimate even if quantity is above maximum).

91,000 gallons of liquids

Basis of estimating and/or computing waste quantity:

Estimates for liquids remaining in tanks and drums on site are based on number of tanks and drums remaining on site, volumes of liquids in tanks and drums, and tank capacities (see Attachment 2.9).

91,000 gallons of liquids = 1820 drums = assigned value 5.

5. **TARGETS** Total Targets Score = 6

Surface Water Use Assigned Score = 2

Use(s) of surface water within 3 miles downstream of the hazardous substance:

There are 100 acres of commercial agricultural acreage irrigated with surface water from the San Antonio River within 3 miles downstream from the location of the hazardous substance.

There is potential use of the surface water for non-contact recreational purposes.

(Attachment 4)
(Reference 10)

Is there tidal influence?

No

Distance to a Sensitive Environment Assigned Score = 0

Distance to 5 acre (minimum) coastal wetland, if 2 miles or less:

None within 2 miles

(Attachment 1.3)
(Reference 4)

Distance to 5 acre (minimum) fresh water wetland, if 1 mile or less:

None within 1 mile
(Attachment 1.3)
(Reference 4)

Distance to critical habitat of an endangered species or national wildlife refuge, if 1 mile or less:

None within 1 mile. However, there are three Federal Category 2 (candidate) species and three Federal Category 2 and state threatened species found within a four mile distance and 15 mile downstream distance of the site. The nearest species is the Federal Category 2 species of Salvia penstemonoides known from Salado Creek.

(Attachment 5.0)

Population Served by Surface Water

Location(s) of water supply intake(s) within 3 mile (free-flowing bodies) or 1 mile (static water bodies) downstream of the hazardous substance and population served by each intake:

No water intakes exist within 3 miles downstream of the site. The City of San Antonio does not use surface water for public supply purposes.

Computation of land area irrigated by above-cited intake(s) and conversion to population (1.5 people per acre):

There are 100 acres of commercial agricultural acreage irrigated with surface water obtained from the San Antonio River between Brooks Air Force Base and Stinson Airport in the 3-4 mile radius and downstream from the site.

(Attachment 1.3 & 4))

Total population served:

100 acres x 1.5 people per acre = 150

Name/description of nearest of above water bodies:

Salado Creek

(Attachment 1.3)

Distance to above-cited intakes, measured in stream miles:

6.5 miles

AIR ROUTE

There are no documented air releases from the site.

J.C. PENNCO WASTE OIL SERVICE
HAZARDOUS RANKING PACKAGE
ATTACHMENTS - INDEX

Attachment 1 Maps

1.1 Street Map of San Antonio. Prepared by H. M. Gousha. 1991 - 1992 Edition.

1.2 Located wells map. General Highway Map, Bexar County, Texas. Prepared by Texas State Highway Department, 1959. Highways revised to September 1, 1966.

1.3 Plotted wells map. General Highway Map, Bexar County, Texas. Prepared by Texas State Highway Department, 1959. Highways revised to September 1, 1966.

1.4 Southton, Elmendorf and San Antonio, East topographic maps, Bexar County, Texas.

Attachment 2 Chronology and Documentation

2.1 Analytical results and CoC tags from field inspection on February 25, 1985.

2.2 Interoffice Memorandum from Byron W. Dixon, Enforcement and Field Operations Division, to Mary Reagan, Assistant General Counsel, TDWR on July 15, 1985.

2.3 CoC tag from field inspection on July 30, 1985.

2.4 Analytical results and CoC tags from field inspection on October 23, 1985

2.5 Interoffice Memorandum from Henry Karnei, Jr., District 8, TWC, to Bill Brown Hazardous and Solid Waste Enforcement, TWC. December 17, 1985

2.6 CoC tag from field inspection on July 17, 1985.

2.7 Interoffice Memorandum from Henry Karnei, Jr., District 8, TWC, to Sam Pole, Hazardous & Solid Waste Division. August 18, 1986

2.8 Solid Waste Inspection Report from site inspection conducted on June 27, 1991 by Henry Karnei, Jr., District 8, TWC. July 8, 1991

2.9 Interoffice Memorandum with Attachments prepared by Henry Karnei, Jr., District 8, TWC, to the File. July 8, 1991

ATTACHMENTS OF INTEROFFICE MEMORANDUM OF JULY 8, 1991

I. Prior to 1984.

II. Prior to 1984.

III. Prior to 1984.

IV. Interoffice Memorandum from Vernon R. Francis, Supervisor, District 8, TDWR to Bryan Dixon, Solid Waste and Spill Response Section, TDWR. May 24, 1985

V. Letter to Ms. Pennington from Robert G. Fleming, Director, Enforcement and Field Operations Division, TDWR. July 15, 1985

VI. Conference record of Site Inspection conducted on July 30, 1985 by Robert Lee, TDWR. July 30, 1985

VII. Letter to Mr. Pennington from Bryan W. Dixon. Chief, Solid Waste and Spill Response Section, TWC. August 19, 1985

VIII. Letter to Mr. Jack McMahon, Defense Property Disposal Office, Kelly Air Force Base from Merton J. Coloton, Chief, Enforcement Section, TWC. September 13, 1985

IX. Letter to Merton J. Coloton, Chief, Enforcement Section, TWC, from George M. Taylor, Director, Marketing, Defense Logistics Agency. October 2, 1985

X. Interoffice Memorandum from Henry Karnei, Jr. District 8, TWC to Bill Brown, Hazardous and Solid Waste Enforcement, TWC. November 18, 1985

XI. Interoffice Memorandum from Henry Karnei, Jr. District 8, to Bill Brown, Hazardous and Solid Waste Enforcement, TWC. December 17, 1985

XII. Interoffice Memorandum from Sherry Pierce, Enforcement Section, TWC, to the File. March 3, 1986

XIII. Interoffice Memorandum from Henry Karnei, Jr. District 8, TWC, to Sam Pole, Enforcement Section, TWC. August 18, 1986

XIV. Letter to Mr. Pennington from Samuel Pole, Chief, Hazardous and Solid Waste Enforcement Section, TWC. July 30, 1986

XV. Interoffice Memorandum from Jim Martin, E.I.T.,

Solid Waste Enforcement Unit, TWC to the File. February 13, 1987

2.10 Interoffice Memorandum from M.L. Patterson, District 8, to J. Hardee, PST Division. July 11, 1991

2.11 Letter to Mr. Pennington from James R. Bard, PST Program Coordinator. July 12, 1991

2.12 Violation Summary Sheet for J.C. Pennco Waste Oil Service. July 25, 1991

2.13 Telephone Memo To the File from M.L. Patterson. July 29, 1991

2.14 Letter to Mr. Pennington from James R. Bard, PST Program Coordinator. August 12, 1991

2.15 Record of Facts Meeting. August 18, 1991

2.16 Interoffice Memorandum to the files from Henry Karnei, Jr., District 8. September 11, 1991

2.17 Letter to Mr. G. E. Johnson, Alamo Drum Co., from Anne C. Dobbs, Hazardous and Solid Waste Enforcement Section, TWC. January 7, 1992

2.18 Letter to Richard Clarke, TWC, from Don Lindsey, Alamo Drum Company. February 24, 1992

2.19 List of attendees from Enforcement Conference for J.C. Pennco. May 15, 1992

2.20 Letter to District 8 from Don Lindsey, Alamo Drum Company. May 29, 1992

2.21 Notice of Fixing Last Date For Filing Proofs Of Claim and Notice Of Discovery of Assets. July 1, 1992

2.22 Trustee's Application for Authority To Employ Counsel. July 6, 1992

2.23 Order Authorizing Employment of Counsel For Trustee. July 10, 1992

2.24 Letter to Henry Karnei, Jr., District 8, TWC, from Thomas Edwards, Attorney General's office, August 19, 1992

2.25 Letter to Mr. Osherrow, Bankruptcy Trustee, from Thomas Edwards, Attorney General's office. September 8, 1992

2.26 Letter to Mr. G.E. Johnson, Alamo Drum Company, from H. Glenn Hall, III, TWC. September 25, 1992

2.27 Interoffice Memorandum with Attachments prepared by DeAnna Epperson, Enforcement Coordinator, TWC, to Ben Wesley, Field Support, TWC. October 15, 1992

Attachments

A. Letter to Mr. Pennington from Anne C. Dobbs, Hazardous and Solid Waste Enforcement Section, TWC. August 20, 1991

B. *Executive Director's Preliminary Report to the Commission* sent to Mr. Pennington, Pennco, and Mr. Gene Johnson, Alamo Drum Co and Solid Waste Inspection Report from site inspections conducted on June 5, June 10, June 27, and August 2, 1991. September 11, 1991

C. Letter entitled *Violations of Texas Solid Waste Disposal Act, the Texas Water Code and Rules of the Texas Water Commission,* to Mr. Pennington, Pennco, and Mr. Johnson, Alamo Drum Company, including copies of the "*Notice of Executive Director's Preliminary Report and Petition for a Texas Water Commission Order Assessing Administrative Penalties and Requiring Certain Actions of J.C. Pennco Waste Oil Service and Alamo Drum Company*" from Jesus Garza, Executive Director, TWC. April 7, 1992

D. Letter to Mary Ruth Holder, Legal Division, TWC from Harry Skeins, Jr., Skeins & Williamson. April 23, 1992

E. Order Combined with Notice of Commencement of Case Under Chapter 7 of the Bankruptcy Code, Meeting of Creditors, and Fixing of Dates filed by Mr. Pennington. May 20, 1992

F. Bankruptcy Documents

G. Letter to Attorney General Morales from Jesus Garza, Executive Director, TWC for *Request for Representation of the Texas Water Commission in Bankruptcy Proceedings.* July 24, 1992

H. Documents from first meeting of Creditors. June 25, 1992

I. Affidavit from DeAnna Epperson, Enforcement Coordinator, TWC, to the Attorney General's Office. October 14, 1992

J. Letter to Anne C. Dobbs, Enforcement Division, from Thomas Edwards, Attorney General's office. October 21, 1992

2.28 Interoffice Memorandum from Anne Dobbs, Manager, Enforcement Section, TWC, to Stennie Meadours, Manager, Emergency Response and Assessment Section, TWC. December 1, 1992

2.29 Letter to DeAnna Epperson, Enforcement Division, from Thomas Edwards, Attorney General's office. January 26, 1993

2.30 Site visit memorandum prepared by Debra D. Hendricks, Superfund Site Discovery & Assessment Team, Emergency Response & Assessment Section, Pollution Cleanup Division, March 4, 1993.

2.31 Site sampling memorandum prepared by Debra D. Hendricks, Superfund Site Discovery & Assessment Team, Emergency Response & Assessment Section, Pollution Cleanup Division, June 2, 1994.

Attachment 3 Immediate Removal

3.1 TNRCC 361.191 Order and Commissioner's Agenda

3.2 Authorization Letter from TNRCC to contractor to perform Immediate Removal.

3.3 Change Order acknowledgement from contractor for berm construction.

3.4 Letter of Authorization from TNRCC to contractor to perform construction of berm.

3.5 Project Report - Immediate Removal.

Attachment 4 Records of Communication

Records of Communication. Location of water wells in relation to the J.C. Pennco Waste Oil Service Site.

Attachment 5 Critical Habitats

Critical Habitats: Texas Natural Heritage Program Information System information on sensitive species and natural communities within a four mile radius and fifteen mile downstream distance of the J.C. Pennco Waste Oil Service site. Texas Parks & Wildlife Department, April 1, 1993

Attachment 6 Deed Records

Warranty Deed and Deed of Trust

Attachment 7 Well Logs

7.1 Located Well Logs from site to 0.25 miles, for parts of Bexar County, Texas. Texas Water Commission Central Records Office, Austin, Texas.

7.2 Plotted Well Logs from site to 0.25 miles, for parts of Bexar County, Texas. Texas Water Commission Central Records Office, Austin, Texas.

7.3 Located Well Logs from 0.25-0.5 miles from site, for parts of Bexar County, Texas. Texas Water Commission Central Records Office, Austin, Texas.

7.4 Plotted Well Logs from 0.25-0.5 miles from site, for parts of Bexar County, Texas. Texas Water Commission Central Records Office, Austin, Texas.

7.5 Located Well Logs from 0.5-1 miles from site, for parts of Bexar County, Texas. Texas Water Commission Central Records Office, Austin, Texas.

7.6 Plotted Well Logs from 0.5-1 miles from site, for parts of Bexar County, Texas. Texas Water Commission Central Records Office, Austin, Texas.

7.7 Located Well Logs from 1-2 miles from site, for parts of Bexar County, Texas. Texas Water Commission Central Records Office, Austin, Texas.

7.8 Plotted Well Logs from 1-2 miles from site, for parts of Bexar County, Texas. Texas Water Commission Central Records Office, Austin, Texas.

7.9 Located Well Logs from 2-3 miles from site, for parts of Bexar County, Texas. Texas Water Commission Central Records Office, Austin, Texas.

7.10 Plotted Well Logs from 2-3 miles from site, for parts of Bexar County, Texas. Texas Water Commission Central Records Office, Austin, Texas.

7.11 Located Well Logs from 3-4 miles from site, for parts of Bexar County, Texas. Texas Water Commission Central Records Office, Austin, Texas.

7.12 Plotted Well Logs from 3-4 miles from site, for parts of Bexar County, Texas. Texas Water Commission Central Records Office, Austin, Texas.

References Record Sheet

Reference 1 Report 239, Ground-water Resources and Model Applications for the Edwards (Balcones Fault zone) Aquifer in the San Antonio Region by William B. Klemt, Tommy R. Knowles, Glenward R. Elder, and Thomas W. Sieh, Texas Department of Water Resources Report 239, October 1979.

Reference 2 Climatic Atlas of the United States, U.S. Department of Commerce, National Climatic Center, Ashville, N.C., 1979.

Reference 3 Appendix I, Hazard Ranking System for the State of Texas

Reference 4 Southton, Elmendorf and San Antonio, East Quadrangles, United States Department of the Interior Geological Survey, Maps edited in 1973, 1973 and 1992 respectively.

Reference 5 Relation of Water Chemistry of the Edwards Aquifer to Hydrogeology and Land Use, San Antonio Region, Texas, U.S. Geological Survey, Water-Resources Investigations Report 87-4116, 1987, p.21.

Reference 6 Dangerous Properties of Industrial Materials, sixth Edition, N. Irving Sax, 1984.

Reference 7 Rainfall Frequency Atlas of the United States, Technical Paper No. 40, U.s. Department of Commerce, U.S. Government Printing Office, Washington, D.C., 1963.

Reference 8 1992-93 Texas Almanac and State Industrial Guide, Copyright 1991, A.H. Belo Corporation P.O. Box 655237, communications Center, Dallas, Texas 75265, Published by the Dallas Morning News.

Reference 9 Report 237, Records of Wells, Chemical Analyses, and Water Levels of Selected Edwards Wells, Bexar County, Texas by Glenn L. Marquardt and Glenward R. Elder, Texas Department of Water Resources Report 237, July 1979, p458.

Reference 10 Intensive Survey of San Antonio River Segments 1901 and 1911, July 23-August 1, 1984, by Stephen R. Twidwell, Texas Department of Water Resources, July 1985.

Reference 11 Bulletin 5911. Ground-Water Geology of Bexar County, Texas by Ted Arnow, United States Geological Survey, October 1959.

Reference 12 Ground-Water Monitoring Seminar Series, United States Environmental Protection Agency, CERI-87-8.